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CLAIMS

What is claimed is:

1. A method of common rate control in a reverse link channel in a CDMA network, comprising:

estimating a reverse link load;

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transmitting a periodic load indication indicative of the reverse link load on a

common control channel to one or more mobile stations;

determining a desired target transmit power based on the estimated reverse link load; and

transmitting the target transmit power to at least one mobile station.

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2. The method of claim 1 wherein transmitting the target transmit power to at least one mobile station comprises transmitting the target transmit power to the mobile station at connection setup.

3. The method of claim 1 wherein transmitting the target transmit power to at least one mobile station comprises transmitting the target transmit power to the mobile station

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following a handoff.

4. The method of claim 1 wherein transmitting the target transmit power to at least one mobile station comprises transmitting the target transmit power to a plurality of mobile stations over a common control channel.

5. The method of claim 1 wherein determining a desired target transmit power

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based on the estimated reverse link load comprises determining an estimated target transmit power for all mobile stations transmitting on the reverse link channel such that the expected total received power at the base station from all mobile stations is at a desired total received power level.

- 5 6. The method of claim 1 wherein determining a desired target transmit power comprises incrementally adjusting the target transmit power based on the periodic load indications.
7. The method of claim 1 wherein a load indication is transmitted periodically to the mobile stations at a predetermined rate change interval.
- 10 8. The method of claim 7 wherein the target transmit power is updated periodically.
9. The method of claim 8 wherein the target transmit power is updated at least once in each rate change interval.
10. A base station comprising:
- 15 receive circuits to receive signals on a reverse link channel from a plurality of mobile stations;
- transmit circuits to transmit periodic load indications indicative of a reverse link load on the reverse link channel and a desired target transmit power on a forward link channel to mobile stations transmitting on the reverse link channel to control the transmission rate of the mobile stations on the
- 20 reverse link channel; and
- control circuits operative to:
- estimate the reverse link load; and
- determine the desired target transmit power based on the estimated reverse link load.
- 25 11. The base station of claim 10 wherein the target transmit power is transmitted to mobile stations at connection setup.
12. The base station of claim 10 wherein the target transmit power is transmitted to mobile stations following a handoff.
13. The base station of claim 10 wherein the target transmit power is transmitted to
- 30 mobile stations periodically.

- 5 14. The base station of claim 10 wherein the control circuits determine the desired target transmit power based on the estimated reverse link load such that the expected total received power at the base station from all mobile stations is at a desired total received power level.
15. The base station of claim 10 wherein the control circuits determine the desired
10 target transmit power by incrementally adjusting the target transmit power based on the periodic load indications.
16. The base station of claim 10 wherein the load indication is transmitted periodically to the mobile stations at a predetermined rate change interval.
17. The base station of claim 16 wherein the control circuit periodically updates the
15 target transmit power
18. The base station of claim 17 wherein the control circuit updates the target transmit power at least once in each rate change interval.
19. A method of dynamically adjusting a data transmission rate of a mobile station, comprising:
- 20 determining a rate change probability as a function of a current transmit power of mobile station; and
selectively changing the data transmission rate of the mobile station based on the rate change probability.
20. The method of claim 19 wherein determining a rate change probability as a
25 function of a current transmit power of mobile station comprises:
storing a target transmit power in the mobile station; and
computing a rate change probability as a function of the current transmit power of the mobile station and the target transmit power.
21. The method of claim 19 further comprising:
30 receiving periodic load indications from a base station; and

5 updating the target transmit power based on the periodic load indications from
the base station.

22. The method of claim 20 wherein computing a rate change probability as a
function of the current transmit power of the mobile station and the target transmit power
comprises:

10 computing a first power differential between the current transmit power and the
target transmit power;
computing a second power differential between the current transmit power and a
maximum or minimum transmit power; and
determining a power differential ratio of the first and second power differentials;
15 and
determining the rate change probability as a function of the power differential
ratio.

23. The method of claim 22 wherein the rate change probability is equal to the power
differential ratio.

20 24. The method of claim 22 wherein the rate change probability is the maximum of 1
and the power differential ratio.

25. The method of claim 20 further comprising receiving the target transmit power
from the base station.

26. The method of claim 20 wherein the target transmit power is received by the
25 mobile station during connection setup.

27. The method of claim 20 wherein the target transmit power is received by the
mobile station following a handoff.

28. The method of claim 20 wherein the target transmit power is received by the
mobile station over a common control channel.

5 29. The method of claim 19 wherein determining a rate change probability as a function of a current transmit power of mobile station comprises:

computing a load tracking value representative of the reverse link load at the mobile station;

computing a first rate change probability if the load tracking value is within a defined range that is dependent on the current transmit power of the mobile station; and

computing a second rate change probability if the load tracking value is outside the defined range.

30. The method of claim 29 wherein the first rate change probability is set to 0 when the load tracking value is within the defined range.

31. The method of claim 29 wherein the second rate change probability varies depending on the distance of the load tracking value from a reference value.

32. The method of claim 31 wherein the rate change probability varies linearly with distance of the load tracking value from the reference value.

33. The method of claim 31 wherein the rate change probability varies non-linearly with distance of the load tracking value from the reference value.

34. A mobile station comprising:

a receiver for receiving periodic load indications from a base station;

a transmitter for transmitting signals to the base station at a variable data

transmission rate:

a controller to vary the data transmission rate of the mobile station, said controller operative to:

determine a rate change probability as a function of a current transmit power of the mobile station; and

5 selectively change the data transmission rate of the mobile station based
on the rate change probability.

35. The mobile station of claim 34 wherein the controller computes the rate change probability as a function the current transmit power of the mobile station and a target transmit power.

10 36. The mobile station of claim 35 wherein the controller further updates the target transmit power based on periodic load indications from the base station.

37. The mobile station of claim 35 wherein controller computes the rate change probability by:

15 computing a first power differential between the current transmit power and the
 target transmit power;
 computing a second power differential between the current transmit power and a
 maximum or minimum transmit power; and
 determining a power differential ratio of the first and second power differentials;
20 and
 determining the rate change probability as a function of the power differential
 ratio.

38. The mobile station of claim 37 wherein the rate change probability is equal to the power differential ratio.

39. The mobile station of claim 37 wherein the rate change probability is the
25 maximum of 1 and the power differential ratio.

40. The mobile station of claim 35 further wherein the mobile station receives the target transmit power from the base station.

41. The mobile station of claim 35 wherein the mobile station receives the target transmit power during connection setup.

5 42. The mobile station of claim 35 wherein the mobile station receives the target
transmit power following a handoff.

43. The mobile station of claim 35 wherein the mobile station receives the target
transmit power over a common control channel.

44. The mobile station of claim 34 wherein the controller determines the rate change
10 probability by:

 computing a load tracking value representative of the reverse link load at the
 mobile station;

 computing a first rate change probability if the load tracking value is within a
 defined range that is dependent on the current transmit power of the
15 mobile station; and

 computing a second rate change probability if the load tracking value is outside
 the defined range.

45. The mobile station of claim 44 wherein the controller sets the first rate change
probability to 0 when the load tracking value is within the defined range.

20 46. The mobile station of claim 44 wherein the controller computes the second rate
change probability as a function of the distance of the load tracking value from a
reference value.

47. The mobile station of claim 46 wherein the rate change probability varies linearly
with distance of the load tracking value from the reference value.

25 48. The mobile station of claim 46 wherein the rate change probability varies non-
linearly with distance of the load tracking value from the reference value.